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ABSTRACT

In order to assess relationships and problems in drawing conclusions regarding productive school practices, a study analyzed the 1984 National Assessment of Educational Progress (NAEP) data on homework and reading achievement among 13-year-olds. A previous study (Lange, 1987) examining the NAEP data set concluded that the number of hours spent on homework is significantly and positively related to reading achievement, and the NAEP's publication, "The Reading Report Card," portrays an overall positive relationship between homework and achievement. However, a series of cross-tabulations, taking into account type of community and level of parental education, revealed that the relationship between amount of homework and reading achievement was not consistent, but varied with type of community and parental education. The absence of a consistent relationship between homework and reading achievement is even more apparent when one conducts cross-tabulations taking into account type of community and percent of minority students in schools attended. In sum, cross-sectional data such as those collected by the NAEP are not likely to reflect sophisticated efforts to improve the effectiveness of homework, and analyses of such data frequently fail to consider other related variables that may affect or mediate relationships between homework and achievement. (Four tables and an excerpt from the NAEP's "The Reading Report Card" are attached.) (ARH)

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HOMEWORK AND READING ACHIEVEMENT

IN NAEP DATA ON THIRTEEN-YEAR-OLDS

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Paper presented at the annual meeting of the

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HOMEWORK AND READING ACHIEVEMENT

IN NAEP DATA ON THIRTEEN-YEAR-OLDS

The major purpose of this study was to analyze 1984 NAEP data on homework and reading achievement among thirteen-year-olds in order to assess relationships and problems in drawing conclusions regarding productive school practices.

A previous study (Lange, 1987) examining relationships between homework (plus other variables) and reading achievement in this data set concluded that the number of hours spent in homework is significantly and positively related to achievement in reading. In pointing out that homework is an "alterable" variable, the author all but stated that the data set supports increased homework as a means to raise reading achievement. Some other analysts also have interpreted such relationships in cross-sectional survey data as supporting the conclusion that assigning more homework to students will have a positive impact on their achievement. However, Lange's study, like much other research dealing with homework, utilized correlation statistics and multiple regression analysis which can magnify or minimize underlying relationships or lack of relationships, and did not control for available school-environment variables which may have substantial impact on these relationships.

My preliminary multiple regression analysis of NAEP data tapes for thirteen-year-olds attending public schools indicated that although the variable "hours of homework" was significantly related to reading achievement, it added less than one-half of one percentage point to the R^2 after taking account of parental education. To more adequately examine relationships between homework and reading achievement in the data set, cross-tabulations were extracted taking account of type of community in which

NAEP schools are located and level of education of respondents' parents. Control for these latter two variables is desirable because they are related both to amount of homework and to reading achievement, and may be generating spurious relationships between the latter two variables.

Inspection of the cross-tabulations indicated that the relationship between amount of homework* and reading achievement is not consistent but rather varies with type of community and parental education. For example, as shown in Table 1, the average reading scores of thirteen-year-olds who attend schools in "small places" were not consistently related to homework when parental education was controlled by tabulating separate scores for those whose parents had some education after high school and those whose parents had completed college. The standard deviation for reading scores in the data set analyzed is 35.57. As indicated in Table 1, small-place students whose parents completed college and who reported not doing their assigned homework had reading scores nearly a third of a standard deviation below those of small-place students who did their homework. Among small-place students whose parents had only some postsecondary education, however, students who reported doing one hour or more of homework had reading scores only slightly higher than those who reported not doing their homework.

Similarly, average reading scores were not consistently related to homework among students whose parents graduated from college but who differed in metropolitan location (i.e. communities high or low in

* The NAEP item was worded as follows: "How much time did you spend on homework yesterday?"

socioeconomic status). As shown in Table 2, among students whose parents graduated from college and live in "low" metropolitan areas, those who reported doing two hours or more of homework had reading scores about a third of a standard deviation higher than those who did less than an hour of homework, but among their counterparts in "high" metropolitan areas, students who reported doing two hours or more of homework scored lower than those who did less than one hour. In addition, both groups differ from the pattern for students whose parents graduated from college and who live in small places (see Table 1), among whom there were basically no or trivial differences between students who did less than one hour, one-to-two hours, or more than two hours of homework.

The differences described above illustrate the wide variation that is found in the relationship between homework and reading achievement when account is taken of type of community and parental education. Inspection of the entire set of cross-tabulations suggests that exceptions can be found even in the case of the most prevalent underlying patterns. For example, although students who report having had no homework assigned had lower reading scores in most comparisons than did those who reported doing one-to-two hours of homework, this pattern was not clearly present among students in small places whose parents had some college (see Table 1). Thus one can sift through the cross-tabulations and find support for whatever conclusion he or she is looking for: homework is positively related to achievement, the two are not related, or, in some comparisons, the relationship is negative. The fact that some investigators have uncovered and reported a small positive relationship in quantitative analysis does not have much meaning when one considers the inconsistency in relationships after taking account of parental education and community type.

The absence of a consistent relationship between homework and reading achievement is even more apparent when one takes account of type of community and percent of minority students in schools attended by NAEP thirteen-year-olds. For this set of comparisons, reading scores of students who reported less than one hour of homework were compared as shown in Table 3 with students reporting one-to-two hours, omitting cells with less than sixteen students and tabulating scores separately according to type of community and attendance at schools with more or less than forty percent minority students. As shown in Table 3, for only four out of twelve sets of cross-tabulations do students who report doing one-to-two hours of homework have average reading scores six points or more higher than those who report doing less than one hour of homework; for a fifth comparison, the difference is five points. For only two of the twelve comparisons do the differences approach one-third of the standard deviation reported for the total NAEP sample.

Perhaps one should not expect that homework data in cross-sectional research such as the NAEP's will help us understand whether school policies and practices regarding homework have a meaningful effect on achievement. Some students who report doing more than two hours of homework may be relatively low achievers who need to study more than others, some students who had homework but didn't do it may be achieving poorly more because they are alienated from school than because their teachers are unwilling or unable to enforce assignments, some students who did not receive homework may tend to be high achievers whose performance satisfied their teachers, and school-type/community influences seem to have substantial effects on both achievement and homework practices, perhaps generating a spurious relationship among the latter variables.

Several such possibilities are apparent in Table 4, which provides the full cross-tabulation of reading scores by parental education and type of community. As shown in the table, 28 percent of the students whose parents did not complete high school said they had no homework assigned the previous day, compared with 25 percent of those whose parents had graduated from high school, 22 percent of students whose parents had some college, and twenty percent of those whose parents completed college. Conversely, ten percent of students whose parents had at least some college reported doing more than two hours of homework, compared with seven percent of students whose parents had not attended college. Thus it appears that students whose parents have relatively little education are assigned less homework than students whose parents have more education. Since reading scores also vary with parents' education level,* one should control for parental education before concluding that amount of homework reported is causally related to achievement. Zero-order relationships between reading scores and homework may well be due largely or entirely to a tendency for teachers of high SES students (measured by parental education or other variables) to assign more homework to their relatively high-achieving classes than teachers of low SES students assign to their relatively low achieving classes.

Similarly, students whose parents did not complete high school are more likely to report that they didn't do assigned homework than are higher SES students. As shown in Table 4, seven percent of the students

* Average reading score by parental education level is as follows: did not complete high school--242; graduated high school--254; some college --265; completed college--266.

whose parents had not completed high school said they had homework assigned for the previous day but didn't do it, compared with four percent of other students. Zero-order correlations between reading and hours of homework may well reflect a tendency for low SES students (who also tend to have low achievement) to ignore their homework, not to some positive independent effect of homework on achievement.

Further evidence regarding the lack of any strong and consistent relationship between homework and achievement is obtained by comparing the reading scores of students who did less than one hour of homework, one-to-two hours of homework, or more than two hours of homework, after controlling for type of community and parental education (Table 4). Among the 27 comparisons between the former two groups for which there are at least sixteen students in each subgroup, in eighteen cases students who did one-to-two hours of homework had higher reading scores than those who did less than an hour. However, in eight of the eighteen cases the difference is three points or fewer--less than one-tenth of a standard deviation. Thus there are only ten of 27 comparisons in which students who reported doing more homework had reading scores more than a tenth of a standard deviation higher.

Similarly, among nineteen comparisons between subgroups with at least sixteen students, there are only five in which students who report doing two hours or more homework have reading scores more than three points higher than those who report one-to-two hours. (Actually, there are six comparisons that go in the opposite direction using the three-point criterion.) One cannot conclude from these data that hours of homework is positively and independently associated with reading achievement among thirteen-year-olds in the NAEP data set.

My goal in this paper has not been to argue that increasing homework cannot bring about improved achievement in elementary and secondary schools. If carried out on a systematic basis coordinated with other aspects of instruction and schooling, increased homework may well help to improve achievement. For example, if a mastery learning approach is introduced and assisted homework is explicitly, selectively, and effectively used to help non-masters attain fluid mastery during the corrective phase, an increase in homework could be a critical factor in providing additional time which low achievers may require to attain specified mastery levels. However, cross-sectional data such as are collected by the NAEP are not likely to reflect sophisticated efforts to improve the effectiveness of homework, and analyses of such data frequently take little or no account of other related variables that may affect or mediate relationships between homework and achievement.

To its credit, the NAEP has warned readers against simplistic interprepation of the zero-order relationship it has found between homework and achievement. Thus a section on "Homework" (see Attachment A in this paper) from the NAEP's (1985) publication titled The Reading Report Card not only points out that this relationship is somewhat different for seventeen-year-olds than it is for thirteen-year-olds, but it also points out that thirteen-year-olds reporting more than two hours of homework do not have higher achievement than those reporting one-two hours, and it states that "the NAEP data cannot show" whether a positive relationship occurs "because good students are given more homework, or because more homework leads to higher reading achievement."

On the other hand, about one-third of the section is devoted to a highlighted table portraying an overall positive relationship between homework and achievement, and the text includes statements indicating

that "teachers have direct control over the amount of homework they assign" and that "Schools clearly believe that homework is valuable and teachers are assigning it more frequently." It would be easy to read the section superficially and come away with the conclusion that NAEP data support a policy emphasizing increased homework. As I have shown above, NAEP data do not support this conclusion. Evidence favoring the efficacy of homework as an achievement-improvement strategy will have to be sought, if anywhere, from other sources.

REFERENCES

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Table 1

Average Reading Scores and Homework Responses of Public-School Thirteen-Year-Olds Who Live in Small Places, by Two Categories of Parent Education.

	Parents With Some Education After High School		Parents Graduated College	
	x	(N)	x	(N)
No homework assigned	265	(149)	264	(375)
Had homework but didn't	263	(41)	259	(77)
Less than 1 hour homework	273	(255)	269	(656)
One-two hours homework	267	(196)	271	(619)
More than 2 hours homework	267	(55)	272	(182)

Source: NAEP data tapes.

Table 2

Average Reading Scores and Homework Responses of Public-School Thirteen-Year-Olds Whose Parents Graduated from College, by Two Categories of Metropolitan Location.

	Low Metropolitan		High Metropolitan	
	x	(N)	x	(N)
No homework assigned	239	(74)	277	(227)
Had homework didn't do it	226	(22)	261	(22)
Less than one hour homework	242	(145)	278	(264)
One-two hours homework	250	(125)	287	(254)
More than two hours homework	256	(58)	273	(76)

Source: NAEP data tapes.

Table 3

Average Reading Scores and Homework Responses of Thirteen-Year-Olds in Public Schools, by Type of Community and Attendance at Schools with More or Less than Forty Percent Minority Enrollment.

Community Type Hours of Homework	Schools More than Forty Percent Black or Hispanic x (N)	Schools Less than Forty Percent Black or Hispanic x (N)
Extreme Rural		
Less than one hour	244 (102)	264 (275)
One-two hours	247 (90)	263 (223)
Low Metropolitan		
Less than one hour	234 (308)	248 (177)
One-two hours	245 (264)	247 (129)
High Metropolitan		
Less than one hour	----	275 (364)
One-two hours	----	281 (327)
Main Big City		
Less than one hour	251 (115)	256 (375)
One-two hours	251 (91)	263 (280)
Urban Fringe		
Less than one hour	----	267 (852)
One-two hours	----	267 (583)
Medium City		
Less than one hour	249 (186)	264 (532)
One-two hours	260 (142)	266 (127)
Small Place		
Less than one hour	240 (182)	261 (2142)
One-two hours	245 (147)	264 (1686)

Source: NAEP data tapes.

Table 4
Average Reading Proficiency Scores and Homework Responses of Thirteen-Year-Olds in Public Schools, by Parental Education and Type of Community.

	Extreme Rural x (N)	Low Metro x (N)	High Metro x (N)	Main Big City x (N)	Urban Fringe x (N)	Medium City x (N)	Small Place x (N)	Total Number of Students in Parental Education Category	Percent
Parents did not complete high school									
No homework assigned	227(37)	234(64)	235(5)	232(35)	244(67)	239(101)	240(214)	523	28
Didn't do it	231(7)	224(13)	232(4)	242(7)	245(18)	239(23)	234(56)	128	07
Less than one hour	243(47)	232(92)	263(7)	237(33)	239(71)	240(92)	244(317)	659	36
One-two hours	243(44)	237(61)	246(4)	241(25)	253(39)	243(48)	250(196)	417	22
More than two hours	249(10)	248(26)	---(0)	255(10)	228(10)	237(15)	235(57)	128	07
								1855	
Parents graduated high school									
No homework assigned	248(128)	234(132)	263(70)	243(123)	250(264)	247(206)	251(708)	1631	25
Didn't do it	241(15)	232(13)	247(8)	252(26)	254(39)	241(43)	240(123)	267	04
Less than one hour	251(183)	238(201)	258(70)	249(188)	257(350)	250(306)	255(1096)	2394	37
One-two hours	252(145)	245(162)	261(48)	255(135)	257(210)	255(203)	258(822)	1725	27
More than two hours	256(28)	235(48)	262(15)	245(28)	261(46)	253(57)	250(218)	440	07
								6457	

Table 4 (cont.)
Average Reading Proficiency Scores and Homework Responses of Thirteen-Year-Olds in Public Schools, by Parental Education and Type of Community.

	Extreme Rural x (N)	Low Metro x (N)	High Metro x (N)	Main Big City x (N)	Urban Fringe x (N)	Medium City x (N)	Small Place x (N)	Total Number of Students in Parental Education Category	Percent
Parents Have Some College									
No homework assigned	278(22)	249(34)	262(19)	268(32)	266(72)	257(60)	265(149)	388	22
Didn't do it	247(6)	253(6)	239(5)	275(6)	256(8)	253(13)	263(41)	85	04
Less than one hour	275(53)	246(47)	300(23)	261(51)	272(104)	267(75)	273(255)	608	35
One-two hours	270(45)	251(45)	275(21)	262(42)	270(85)	278(70)	267(196)	504	29
More than two hours	262(12)	257(27)	290(8)	254(12)	273(22)	266(16)	267(55)	152	09
								1737	
Parents Completed College									
No homework assigned	271(46)	239(74)	277(227)	256(90)	265(222)	259(149)	264(375)	1183	20
Didn't do it	257(18)	226(22)	261(22)	251(20)	252(28)	258(46)	259(77)	233	04
Less than one hour	272(94)	242(145)	278(264)	262(218)	272(338)	272(362)	269(656)	2077	35
One-two hours	272(79)	250(125)	287(254)	266(169)	274(262)	271(353)	271(619)	1851	31
More than two hours	267(24)	256(58)	273(76)	266(57)	271(85)	269(91)	272(182)	573	10
								5927	

Source: NAEP data tapes.

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ATTACHMENT A

Excerpt on "Homework" from the NAEP's The Reading Report Card

Schools can do little except complain about the amount of time children may spend watching television. But teachers have direct control over the amount of homework they assign. The 1980 and 1984 assessments included a question asking students how much time they spent on homework. The relationships between reading proficiency and student answers to this question are summarized in **Table 4.1**. (Note that the question asks about homework in general and not about reading assignments in particular.)

Homework

TABLE 4.1

		1980		1984	
		Percent of Students	Reading Proficiency	Percent of Students	Reading Proficiency
Age 13:	None assigned	30%	253	20%	255
	Did not do it	6	251	3	248
	Less than 1 hour	32	258	32	261
	1-2 hours	24	262	26	265
	More than 2 hours	7	259	8	263
	Missing	< 1	—	12	—
Age 17:	None assigned	31%	277	22%	278
	Did not do it	12	286	11	288
	Less than 1 hour	24	287	26	289
	1-2 hours	22	288	26	293
	More than 2 hours	10	292	13	299
	Missing	1	—	1	—

In general, students who receive homework assignments and do them tend to read at higher proficiency levels than students who do not have assigned homework or who do not do their assigned homework. At age 13, reading proficiency was highest for students who spent from one to two hours per night on homework; at age 17, for those who spent more than two hours. Nine-year-olds were not asked about homework until the most recent assessment.

The amount of homework that students do seems to be related to their reading proficiency, though the NAEP data cannot show whether this is because good students are given more homework or do more homework, or because more homework leads to higher reading achievement. As a further complication, at age 13 students who do more than two hours of homework have slightly lower reading proficiency than those who do one to two hours. This may indicate that students who read less well take longer to do their homework or that these students are assigned additional homework, rather than that more homework is deleterious to the development of reading proficiency. In contrast, at age 17 increasing time spent on homework is systematically related to increasing levels of reading proficiency.

Schools clearly believe that homework is valuable and teachers are assigning it more frequently. Between 1980 and 1984, the proportion of students reporting that they had *no* assigned homework the previous day dropped for both 13- and 17-year-olds. In 1980, fully 31 percent of the 17-year-olds had not been given any homework the previous day; in 1984, this had been reduced to 22 percent. Of the 13-year-olds, 30 percent reported no homework assignment in 1980, but this dropped to 20 percent in 1984. Furthermore, the percentage of 13-year-olds who did not do assigned homework dropped from 6 to 3 percent over the four-year period, while the percentage of 17-year-olds dropped from 12 to 11 percent.

National Assessment of Educational Progress, The Reading Report Card